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1591 U.S. PTO
08/900735
07/24/97

ATTORNEY DOCKET NO. 07043/015007

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : M. Allen Northrup et al. Art Unit: Not yet assigned
 Serial No.: Not yet assigned Examiner: Not yet assigned
 Filed : Herewith
 Title : MICROFABRICATED REACTOR

Assistant Commissioner for Patents
 Washington, DC 20231

INFORMATION DISCLOSURE STATEMENT

Applicants submit this IDS and the attached Form PTO-1449.

Under 35 USC §120, this application relies on the earlier filing date of application Serial No. 08/814,635 filed on March 10, 1997. The following references were submitted to and/or were cited by the Office in the prior application and, therefore, are not provided in this application:

2 1 2 7 1 9 3	8/16/38	Toulmin, Jr.
3 0 2 9 7 4 3	4/17/60	Johns
4 2 1 9 3 3 5	8/26/80	Ebersole
4 5 5 6 4 6 7	12/3/85	Kuhn, et al.
4 5 9 6 6 9 7	6/24/86	Ballato

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4 5 9 8 0 4 9	7/1/86	Zelinka, et al.
4 6 0 2 1 8 4	7/22/86	Meitzler
4 6 3 2 8 0 8	12/30/86	Yamamoto, et al.
4 6 7 3 6 5 7	6/16/87	Christian
4 6 7 6 2 7 4	6/30/87	Brown
4 6 8 3 1 9 5	7/28/87	Mullis, et al.
4 6 9 2 6 5 4	9/8/87	Umemura, et al.
4 7 0 8 9 3 1	11/24/87	Christian
4 7 3 7 4 6 4	4/12/88	McConnell, et al.
4 7 5 9 8 2 8	7/26/88	Young, et al.
4 9 0 8 1 1 2	3/13/90	Pace
4 9 2 0 0 5 6	4/24/90	Dasgupta
4 9 5 2 2 6 6	8/28/90	Tsuruta, et al.
4 9 6 0 4 8 6	10/02/90	Perkins, et al.
4 9 6 3 4 9 8	10/16/90	Hillman, et al.
5 0 0 0 8 1 7	3/19/91	Aine
5 0 0 3 8 2 2	4/2/91	Joshi
5 1 5 3 4 7 6	10/6/92	Kosinski
5 2 1 2 9 8 8	5/25/93	White, et al.
5 2 2 0 1 8 9	6/15/93	Higashi, et al.
5 2 2 9 2 9 7	7/20/93	Schnipelsky, et al.
5 2 5 2 2 9 4	10/12/93	Kroy, et al.
5 2 7 0 1 8 3	12/14/93	Corbett, et al.
5 2 9 6 3 7 5	3/22/94	Kricka, et al.
5 3 0 4 4 8 7	4/19/94	Wilding, et al.
5 3 8 4 0 2 9	1/24/95	Campbell
5 3 8 5 7 0 9	1/31/95	Wise, et al.
5 4 2 7 9 4 6	6/27/95	Kricka et al.
5 4 8 6 3 3 5	1/23/96	Wilding, et al.
5 4 9 8 3 9 2	3/12/96	Wilding, et al.
0 347 579 A2	5/16/89	EPO

0 381 501 B1	8/6/94	EPO
0 385 964	1/9/90	EPO
0 402 995 A2	12/19/90	EPO
0 483 117 A2	4/29/92	EPO
2650657	2/8/91	France
DE 38 11 052	8/24/89	Germany
WO 91/16966	11/14/91	PCT
1-280694	11/1989	Japan
1,721,311	03/1992	Russia
6-50974	2/25/94	Japan
WO 91/16966	11/14/91	PCT
WO 93/22058	11/11/93	PCT

OTHER DOCUMENTS

Andle, J. et al., "Detection of Nucleic Acid Hybridization with an Acoustic Plate Mode Microsensor," *IEEE ULTRASONICS SYMPOSIUM*, Vol.1, Honolulu, Hawaii, December 4-7, 1990, pp. 291-294.

Angell, James B., et al., "Silicon Micromechanical Devices," *Scientific American*, (April 1983) Vol. 248, No. 4, pp. 44-55

Backman, Keith, "Ligase Chain Reaction: Diagnostic Technology for the 1990s and Beyond," *Clinical Chemistry*, (1992) Vol. 38, No. 3, pp. 457-458.

Erlich, Henry A., ed., "PCR Technology, Principles and Applications for DNA Amplification," *PCR Technology* M Stockton Press, (1989) pp. 32-38.

Esashi, Masayoshi, et al., "Integrated Flow Control Systems Fabricated on a Silicon Wafer," *Proceedings, Electrochemical Society Conference, III* (18-23 Oct. 1987) Electrochemical Society, Pennington, N.J. pp. 31-38B.

Fromberz, Peter, et al., "Core-coat conductor of lipid bilayer and micromachined silicon," *Biochemica et Biophysica Acta.* (1991) Vol. 1062, pp. 103-107.
Gibbs, Richard A., "DNA Amplification by the Polymerase Chain Reaction," *Analytical Chemistry*, (July 1, 1990) Vol. 62, No. 13, pp. 1202-1214.

Heller, M. J., et al., "An Efficient Method for Extraction of DNA from Formalin-Fixed, Paraffin-Embedded Tissue by Sonication," *BioTechniques*, (1991) Research Report, Vol. 11, No. 3, pp. 372-374 and 476-477.

Higuchi, Russel, et al., "Simultaneous Amplification and Detection of Specific DNA Sequences," *Biotechnology*, (April 1992), Vol. 10, pp. 413-417.

Hoopman, Timothy L., "Microchanneled Structures,"
Microstructures, Sensors and Actuators, (1990) Cho, et al.
Eds. The American Society of Mechanical Engineers
(4 pages)

Howe, Roger T., et al., "Resonant-Microbridge Vapor
Sensor," *IEEE Transactions on Electron Devices*, (April
1986) Vol. ED-33, No. 4, pp. 499-506

Howe, R.T., et al., "Silicon Micromechanics: sensors and
actuators on a chip," *IEEE Spectrum*, July 1990, pp. 29-35.

Kawasaki, Ernest S., "Sample Preparation from Blood,
Cells, and Other Fluids," *PCR Protocols, A Guide to
Methods and Applications*, (1990) Innis, Michael A., et
al., ed., Academic Press, Inc., Chapter 18, pgs. 146-149

Kricka, et al., "Liquid Transport in Micron and Submicron
Channels," *SPIE*, 1167:159-168 (1989).

Mandenius, Carl Fredrik, et al., "The Interaction of
Proteins and Cells with Affinity Ligands Covalently
Coupled to Silicon Surfaces as Monitored by Ellipsometry,"
Analytical Biochemistry, (1984) Vol. 137, pp. 106-114.

Manz, A., et al., "Micromachining of monocrystalline silicon and glass for chemical analysis systems," *Trends in Analytical Chemistry*, (1991) Vol. 10, No. 5, pp. 144-149.

Masuda, Senichi, et al., "Novel Method of Cell Fusion in Field Constriction Area in Fluid Integrated Circuit," *Proceedings IEEE/IAS Meeting*, (1987) pp. 1549-1553.

Oste, Christian, "Polymerase Chain Reaction," *BioTechniques*, (1988) Vol. 6, pp. 162-167

Parce, J. Wallace, et al., "Detection of Cell-Affecting Agents with a Silicon Biosensor," *Science*, (Oct. 13, 1989) Vol. 24, pp. 243-247

Pfahler, P., et al., "Liquid Transport in Micron and Submicron Channels," *Sensors & Actuators*, (1990) pp. 431-434.

Sato, Kazuo, et al., "Individual and Mass Operation of Biological Cells using Micromechanical Silicon Devices," *Sensors and Actuators*, (1990) A21-A23:948-953.

Senturia, Stephen D., et al., Section 2,5:Microprocessor Packaging, (Paper presented at the 14th Automotive Materials Conference, Ann Arbor, MI, U.S.A. November 19, 1986, pp. 185-191.) Reprinted with permission from *Sensors and Actuators*, Vol. 15, pp. 221-234, November 1988.

Shoji, Shuichi, et al. "Prototype Miniature Blood Gas Analyzer Fabricated on a Silicon Wafer," *Sensors and Actuators* (1988), Vol. 15, pp.101-107.

Sundaram, Mani, et al., "New Quantum Structures," *Science*, November 29, 1991, Vol. 254, pp. 1326-1335.

Van Lintel, H.T.G., et al., "A Piezoelectric Micropump Based on Micromachining of Silicon," *Sensors and Actuators*, 15 (1988) pp. 153-167.

Vossen, John L., et al., "Thin Film Processes," Copyright 1978 Academic Press, Inc., Chapter I-1, pg. 5 and Chapter III-2, pg. 309.

Washizu, Masao, et al., "Handling of Biological Cells Using Fluid Integrated Circuit," *Proceedings IEE/IAS MEETING*, (1988) pp. 1735-1740.

Wenzel, Stuart T. et al., "A Multisensor Employing an Ultrasonic Lamb-Wave Oscillator," IEEE Transactions on Electron Devices, June 1988, Vol. 35, No. 6, pp. 735-743.

White, R., U.S. Patent Application No. 07/162,193, filed February 29, 1988, now abandoned.

Whitesides, Goerge M., "Molecular Self-Assembly and Nanochemistry: A Chemical Strategy for the Synthesis of Nanostructures," Science, Vol. 254, pp. 1312-1319.

Wise, K.D., et al., "Microfabrication techniques for Integrated Sensors and icrosystems," Science, (Nov. 29, 1991) Vol. 254, pp. 1335-1342.

Wittwer, Cart T., et al., "Minimizing the Time Required for DNA Amplification by Efficient Heat Transfer to Small Samples," Analytical biochemistry, (1990) Vol. 186, pp.328-331.

This statement is being filed before the receipt of a first Office Action on the merits.

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06-1050.

Respectfully submitted,

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